AMENDMENTS

In the specification:

Please amend paragraph [0055] as follows:

[0055] At the output of the multiplexer 120, the multiplex comprises time shifted (t1, t2, t3, t4) pulses at different wavelengths λ1, λ2, λ3, λ4 and different intensity I1, I2, I3, I4. As shown in FIG. 2, each 100 ps pulse is compressed so that at the output of the multiplexer, the pulses are only 25 ps such that the four output pulses have total temporal width of 100 ps.

In the claims:

1. (Currently Amended) An optical device ~~for converting wavelength division multiplex (WDM) signals having pulses which are simultaneous and carried at different wavelengths into an optical time division multiplexing/demultiplexing (OTDM) signal having components which are carried at a same wavelength and time shifted, the device~~ comprising:

a time-shifting means ~~configured to introduce~~ for inducing [[a]] time shifts ~~between the pulses of the~~ into one or more ~~WDM~~ input signals, wherein the one or more input signals have different optical carrier frequencies ~~which are simultaneous and carried at the different wavelengths by optical carriers~~;

a modulation means ~~configured to modify~~ for modulating optical power of the ~~WDM~~ one or more input signals, wherein the modulated time-shifted signals have different optical power levels;

a multiplexing means for multiplexing the modulated time-shifted signals ~~an optical spectral and temporal multiplex er/demultiplexer~~;

a birefringent propagation medium for producing an optical time division multiplexing (OTDM) signal by applying a soliton trapping to induce frequency shifts into the multiplexed modulated time-shifted signal, wherein an amount of the frequency shift introduced to each component of the multiplexed modulated time-shifted signals is in correspondence with the optical power level of that component ~~into which the WDM signals having the pulses which are~~

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~~simultaneous and carried at the different wavelengths are injected to achieve a soliton trapping~~; and

an absorption means for adjusting the optical power of each component of the OTDM signal so that all components have substantially similar optical power levels ~~configured to introduce optical losses into the components of the OTDM signal~~.

2. (Currently Amended) An optical device ~~for converting an optical time division multiplexing/demultiplexing (OTDM) signal components which are time shifted and carried at a same wavelength into wavelength division multiplex (WDM) signals having pulses which are simultaneous and carried at different wavelengths, the device~~ comprising:

an absorption means for adjusting optical power levels of individual components of an input signal, wherein the components of the input signal are optical time division multiplexed (OTDM) and have a same optical carrier frequency, and wherein the adjusted components have different optical power levels ~~configured to introduce optical losses into the components of the OTDM signal~~;

a birefringent propagation medium for applying a soliton trapping to induce frequency shifts into the power adjusted components of the input signal so that each component has a different optical carrier frequency, wherein the account of frequency shift induced to each component is in correspondence with the optical power level of that component ~~into which the OTDM signal having the components wich are time shifted and carried at the same wavelength is injected to achieve soliton trapping~~;

an optical demultiplexing means for demultiplexing the frequency shifted signal components ~~an optical spectral and temporal multiplexer/demultiplexer~~; and

a modulation means for modulating the optical power levels of the demultiplexed frequency shifted signal components so that all signal components have substantial similar optical power levels ~~configured to modify optical power of the WDM signals having the pulses which are simultaneous and carried at the different wavelengths~~.

3. (Currently Amended) The device ~~according to~~ <u>of</u> claim 2, further comprising:

<u>a</u> shifting means <u>for inducing</u> ~~configured to introduce a~~ time shift<u>s into the demultiplexed frequency shifted signal components to reduce relative time delays</u> ~~between the pulses of the WDM signals carried by optical carriers~~.

4. (Currently Amended) The device ~~according to~~ <u>of</u> claim 1, wherein the shifting means comprise<u>s</u> variable delay lines.

5. (Currently Amended) The device ~~according to~~ <u>of</u> claim 1, wherein the modulation means comprise<u>s</u> variable attenuators.

6. (Currently Amended) The device ~~according to~~ <u>of</u> claim 1, further comprising:

a polarization controller at an entry of the birefringent propagation medium ~~to encourage injection of WDM/OTDM signals into said propagation medium with a polarization at~~ <u>for converting a polarization of the power adjusted components of the input signal to</u> 45° to main axes of the birefringent propagation medium.

7. (Currently Amended) The device ~~according to~~ <u>of</u> claim 1, wherein the absorption means comprise<u>s</u> an electro-absorption modulator.

8. (Currently Amended) The device ~~according to~~ <u>of</u> claim 1, wherein the absorption means comprise<u>s</u> a saturable absorber.

9. (Currently Amended) A method ~~for converting wavelength division multiplex (WDM) signals having pulses which are simultaneous and carried at different wavelengths into an optical~~

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~~time division multiplexing/demultiplexing (OTDM) signal having components which are time shifted and carried at a same wavelength, the method~~ comprising ~~the steps of~~:

~~time shifting the pulses of the WDM signals which are simultaneous and carried at the different wavelengths by optical carriers;~~

~~attenuating the WDM signals such that the WDM signals have different optical powers;~~

~~spectrally and temporally multiplexing the WDM signal having the pulses which are simultaneous and carried at the different wavelengths;~~

~~injecting the WDM signals having the pulses which are simultaneous and carried at the different wavelengths into a birefringent propagation medium to achieve soliton trapping and obtain the OTDM signal having the components which are time shifted and carried at the same wavelength; and~~

~~equalizing the optical power of components of the obtained OTDM signal having the components which are time shifted and carried at the same wavelength.~~

receiving a plurality of optical signal components, wherein the plurality of optical signal components have different optical carrier wavelengths;

generating a multiplexed optical signal from the plurality of optical signal components, wherein each component of the multiplexed optical signal has a different optical power level, a different time delay, and a different carrier wavelength;

frequency shifting the components of the multiplexed signal to a single optical carrier wavelength using a birefringent propagation medium to form an optical time division multiplexed (OTDM) signal at the single optical carrier wavelength, wherein an amount of the frequency shift induced to each signal component is in correspondence with the optical power level of that signal component; and

equalizing the components of the OTDM signal so that all components of the OTDM signal have substantially similar optical power levels.

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10. (Currently Amended) A method ~~for converting an optical time division multiplexing/demultiplexing (OTDM) signal having components of which are time shifted and carried at a same wavelength into wavelength division multiplex (WDM) signals having pulses which are simultaneous and carried at different wavelengths, the method~~ comprising ~~the steps of~~:

~~attenuating the components of the OTDM signal~~ adjusting optical power levels of one or more signal components of an optical time division multiplexed (OTDM) signal such that the one or more signal components have different optical power levels;

~~injecting the OTDM signal into a birefringent propagation medium to achieve soliton trapping and recover a WMD signal having the pulses which are simultaneous and carried at the different wavelengths;~~

frequency shifting the power adjusted signal components using a birefringent propagation medium to different optical carrier wavelength, wherein an amount of the frequency shift imparted to each signal component is in correspondence with the power level of that signal component;

~~spectrally and temporally~~ demultiplexing the ~~WMD~~ frequency shifted power adjusted signal components to obtain ~~a plurality of WDM~~ one or more single wavelength signals ~~having pulses which are time shifted and carried at the different wavelengths~~; and

equalizing the optical power of the one or more single wavelength signals so that the one or more single wavelength signals have substantially similar optical power levels ~~pulses of each of said recovered plural WDM signals which are timed shifted and carried at the different wavelengths~~.

11. (Currently Amended) The method ~~according to~~ of claim 10, further comprising:

removing relative time delays among the one or more single wavelength signals by time shifting the one or more single wavelength signals ~~pulses of each of said plural WDM signals carried by resulting optical carriers to render them simultaneous~~.

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12. (Currently Amended) The device ~~according to~~ of claim 9 [[2]], wherein ~~the shifting means comprise~~ the generating a multiplexed optical signal from the one or more optical signal components further comprises inducing a different time delay to each of the one or more optical signal components by time shifting the one or more optical signal components using variable delay lines.

13. (Currently Amended) The device ~~according to~~ of claim 12 [[2]], wherein ~~the modulation means comprise~~ the generating a multiplexed optical signal from the one or more optical signal components further comprises modulating an optical power of each of the one or more optical signal components using variable attenuators.

14. (Currently Amended) The device ~~according to~~ of claim 9 [[2]], wherein frequency shifting the components of the multiplexed signal to a single optical carrier wavelength using a birefringent propagation medium further comprises converting a polarization of the multiplexed signal to 45° to main axes of the birefringent propagation medium to facilitate the frequency shifting ~~further comprising:~~

~~a polarization controller at an entry of the birefringent propagation medium to encourage injection of WDWOTDM signals into said propagation medium with a polarization at 45° to main axes of the birefringent propagation medium~~.

15. (Currently Amended) The device ~~according to~~ of claim 9 [[2]], wherein the components of the OTDM signal are equalized by an absorption means ~~comprise~~ comprising an electro-absorption modulator.

16. (Currently Amended) The device ~~according to~~ of claim 9 [[2]], wherein the components of the OTDM signal are equalized by an absorption means ~~comprise~~ comprising a saturable absorber.

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